Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A process of producing a purified compressed gas stream comprising:

a) removing impurities from a gas feed stream by passing said gas feed stream through an adsorption sector of a continuously rotating rotary contactor in a direction parallel to an axis of rotation of said rotary contactor resulting in a purified gas and wherein said rotary contactor comprises an adsorbent material;

b) regenerating said continuously rotating rotary contactor by passing a regenerating gas stream through a regeneration sector of said rotating rotary contactor, wherein said regenerating gas stream is at a higher temperature than said gas feed stream;

c) then passing a cooling stream through a cooling sector of said rotating rotary contactor to prepare said rotating rotary contactor for said gas feed stream to pass through said adsorption ~~portion~~ sector of said continuously rotating rotary contactor; and

d) compressing said purified gas by passing said purified gas through at least one compressor.

Claim 2 (original): The process of claim 1 wherein said regenerating gas stream comprises a gas stream that has a lower impurity content than said gas feed stream.

Claim 3 (currently amended): The process of claim 1 wherein said regenerating gas ~~flow~~ stream is co-current to the direction of said gas feed stream.

Claim 4 (currently amended): The process of claim 1 wherein said regenerating gas ~~flow~~ stream is counter-current to the direction of said gas feed stream.

Claim 5 (currently amended): The process of claim 1 wherein said cooling ~~gas flow~~ stream is cocurrent to the direction of said gas feed stream.

Claim 6 (currently amended): The process of claim 1 wherein said cooling ~~gas flow~~ stream is countercurrent to the direction of said gas feed stream.

Claim 7 (currently amended): The process of claim 1 wherein said regenerating gas ~~flow~~ stream is a portion of said purified gas that is diverted to become the regenerating gas ~~flow~~ stream and is then heated to an appropriate temperature to function as a regenerating gas.

Claim 8 (currently amended): The process of claim 1 wherein said cooling ~~gas flow~~ stream is a portion of said purified gas that is diverted to become the cooling ~~gas flow~~ stream and is then cooled as necessary to an appropriate temperature to function as a cooling gas.

Claim 9 (currently amended): The process of claim 1 wherein said cooling ~~gas flow~~ stream and said regenerating gas ~~flow~~ stream are both flowing countercurrent to said gas feed stream.

Claim 10 (original): The process of claim 1 wherein said purified gas comprises less than 200 ppm water vapor.

Claim 11 (original): The process of claim 1 wherein said purified gas comprises a gas selected from the group consisting of air, light hydrocarbons, nitrogen, carbon dioxide and oxygen.

Claim 12 (original): The process of claim 1 wherein said impurities removed from said gas feed stream comprise one or more of the following gases selected from the group consisting of nitrous oxide, light hydrocarbons, carbon dioxide, light sulfur compounds, hydrochloric acid, mineral acids and water vapor.

Claim 13 (currently amended): The process of claim 1 wherein the said ~~compression~~ compressing of said purified gas generates heat that is used to warm said regenerating gas ~~flow~~ stream.

Claim 14 (original): The process of claim 1 wherein the regenerating gas stream comprises a portion of the purified gas stream.

Claim 15 (currently amended): The process of claim 1 wherein the cooling [[gas]] stream comprises a portion of the purified gas stream.

Claim 16 (currently amended): A process of producing a dried gas stream containing less than 200 PPM of water comprising:

a) removing water from a gas feed stream by passing said gas feed stream through an adsorption sector of a continuously rotating rotary contactor in a direction parallel to an axis of rotation of said continuously rotating rotary contactor resulting in a dried gas containing less than 200 PPM of water wherein said rotary contactor comprises an adsorbent material;

b) regenerating said continuously rotating rotary contactor by passing a regenerating gas stream through a sector of said rotating rotary contactor wherein said regenerating gas stream is at a higher temperature than said gas feed stream; and

c) passing a cooling stream through a cooling sector of said rotating rotary contactor to prepare said rotating rotary contactor for said gas feed stream to

pass through said adsorption ~~portion~~ sector of said continuously rotating rotary contactor.

Claim 17 (currently amended): The process of claim 16 wherein said dried gas ~~stream~~ contains less than 100 ppm of water.

Claim 18 (currently amended): The process of claim 16 wherein said dried gas ~~stream~~ contains less than 25 ppm of water.

Claim 19 (original): The process of claim 16 wherein said gas feed stream is air.

Claim 20 (currently amended): The process of claim 16 wherein said regenerating gas ~~flow~~ stream is counter-current to the direction of said gas feed stream.

Claim 21 (currently amended): The process of claim 16 wherein said cooling ~~gas flow~~ stream is cocurrent to the direction of said gas feed stream.

Claim 22 (currently amended): The process of claim 16 wherein said cooling ~~gas flow~~ stream is countercurrent to the direction of said gas feed stream.

Claim 23 (original): The process of claim 16 wherein said gas feed stream is dried prior to compression of said dried gas.

Claim 24 (original): A process for purification of a gas feed stream comprising first passing a gas feed stream containing at least one impurity across an adsorption zone of a first continuously rotating rotary adsorbent contactor to produce a partially purified product gas; passing said partially purified product gas across an adsorption zone of a second continuously rotating rotary adsorbent contactor to further purify said partially purified product gas and to produce a highly purified product gas.

Claim 25 (original): The process of claim 24 wherein both rotary adsorbers consist of adsorption, regeneration and cooling sector.

Claim 26 (original): The process of claim 25 wherein a regeneration stream flowing through the regeneration sector of the second continuously rotating rotary adsorbent contactor comprises a heated portion of the highly purified product gas, and a cooling stream flowing through the cooling sector of the second continuously rotating rotary adsorbent contactor comprises a cooled portion of the highly purified product gas.

Claim 27 (original): The process of claim 26 wherein the regeneration stream for the first continuously rotating rotary adsorbent contactor comprises the effluent streams from the cooling and regeneration sectors of the second continuously rotating rotary adsorbent contactor.

Claim 28 (original): The process of claim 27 wherein the regeneration stream for the first continuously rotating rotary adsorbent contactor further comprises a stream having the same composition as the gas feed stream.

Claim 29 (original): The process of claim 24 wherein the gas feed stream is air.

Claim 30 (original): The process of claim 24 wherein at least one impurity is water.

Claim 31 (original): The process of claim 24 further comprising passing said highly purified product gas across an adsorption zone of a third continuously rotating rotary adsorbent contactor to further purify said highly purified product gas to produce an ultra high purity product gas.

Claim 32 (original): The process of claim 24 comprising passing the partially purified product gas of the first continuously rotating rotary adsorbent contactor across a heat exchanger to cool said partially purified product gas prior to contact of said partially purified product gas with said second continuously rotating rotary adsorbent contactor.

Claim 33 (original): The process of claim 24 wherein said first and said second continuously rotating rotary adsorbent contactors each comprise at least one adsorption sector, at least one regenerating sector and at least one cooling sector.

Claim 34 (original): The process of claim 24 wherein said first continuously rotating rotary adsorbent contactor comprises an adsorption zone and a regeneration zone.

Claim 35 (original): The process of claim 31 wherein said first continuously rotating rotary adsorbent contactor is contacted with a regenerating stream that is either lower in water content or lower in temperature than said gas feed stream and wherein there is no cooling zone on said first continuously rotating rotary adsorbent contactor.

Claim 36 (original): The process of claim 24 wherein said second continuously rotating rotary adsorbent contactor comprises an adsorbent that is selective for removal of water from a gas stream.

Claim 37 (original): The process of claim 24 wherein said second continuously rotating rotary adsorbent contactor is selective for removal of carbon dioxide from a dry gas.

Claim 38 (original): The process of claim 31 wherein said third continuously rotating rotary adsorbent contactor is selective for removal of carbon dioxide from a dry gas.

Claim 39 (original): The process of claim 24 further comprising compression of said purified gas by passing said purified gas through at least one compressor.

Claim 40 (original): The process of claim 31 further comprising compression of said purified gas by passing said purified gas through at least one compressor.

Claim 41 (currently amended): The process of claim 40 wherein said compression of said purified gas generates heat that is used to warm at least one regenerating ~~gas flow~~ stream.

Claim 42 (currently amended): The process of claim 40 wherein said compression of said purified gas generates heat that is used to warm at least one regenerating ~~gas flow~~ stream.

Claim 43 (original): A system for purifying and compressing a gas feed stream, said system comprising:

a) an inlet for a gas feed stream to convey said gas feed stream to at least one rotary adsorbent contactor comprising at least one adsorbent material to remove at least one impurity from said gas feed stream;

b) connecting means to send said gas feed stream from said rotary adsorbent contactor to a gas compressor; and

c) said gas compressor.

Claim 44 (currently amended): The system of claim 43 wherein said rotary adsorbent contactor rotates around an axis of rotation, and wherein said gas feed stream flows in a direction parallel to said axis of rotation through at least one adsorbent sector of said rotary contactor, wherein said impurities are adsorbed within said adsorbent sector of said rotary contactor and wherein a regenerating gas flows through at least one regeneration sector of said rotary contactor, wherein said impurities are desorbed within said ~~second~~ regeneration sector of said rotary contactor.

Claim 45 (original): The system of claim 44 further comprising a cooling sector of said rotary contactor wherein a flow of gas having a cooler temperature than at least one of the adsorbent sector or the regeneration sector is passed through said cooling sector of said rotary contactor.

Claim 46 (currently amended): The system of claim 44 wherein said regenerating gas ~~flow~~ is co-current to the direction of said gas.

Claim 47 (currently amended): The system of claim 44 wherein said regenerating gas ~~flow~~ is counter-current to the direction of said gas.

Claim 48 (currently amended): The system of claim 44 wherein said ~~compressed~~ gas feed stream is compressed by said gas compressor and then is sent to an air separation plant to separate said compressed gas into nitrogen, oxygen and other gases.

Claim 49 (original): The system of claim 44 wherein said system produces purified, compressed air is an instrument air drying system.

Claim 50 (original): The system of claim 44 wherein said system produces purified, compressed air for an air brake system in a vehicle.

Claim 51 (original): The system of claim 44 wherein said adsorbent material is selected from the faujasite, silica gel, alumina and mixtures thereof.

Claim 52 (original): The system of claim 51 wherein said faujasite is in the sodium, rare earth, calcium, ammonium, or hydrogen form, or mixtures thereof.

Claim 53 (currently amended): The system of claim 44 further comprising a downstream adsorbent wheel located downstream from said compressor to further purify said ~~compressed~~ gas feed stream and means to conduct flow of said ~~compressed~~ gas feed stream from said compressor to said downstream adsorbent wheel located downstream from said compressor.

Claim 54 (original): The system of claim 44 further comprising a second rotary adsorbent contactor to further purify said gas stream.

Claim 55 (original): The system of claim 54 further comprising a third rotary adsorbent contactor comprising at least one adsorbent material to produce an ultra high purity product gas.

Amendments to the Drawings:

The attached sheet of drawing includes a change to FIG. 6. In FIG. 6, the arrow for element 54 has been changed to go in the opposite direction. This sheet, which also includes FIGS. 1-5, replaces the original sheet 1/4.

Attachments: Replacement Sheet 1/4
Annotated Sheet Showing Change